Samira Malek

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Education

Pennsylvania State University — **Pennsylvania, USA**
Ph.D. of Computer Science, Research Assistant — *January 2023-Present*
GPA: 3.92 out of 4

Sharif University of Technology — **Tehran, Iran**
Master of Electrical Engineerings, Communications System — *2018-2020*
GPA: 3.61 out of 4 (16.97/20), Ranked as 1st university in Iran based on QS Ranking.

Sharif University of Technology — **Tehran, Iran**
Bachelor of Electrical Engineerings, Communications — *2013-2018*
GPA: 3.37 out of 4 (16.37/20)

Research Interests

- Machine Learning
- Deep Learning
- Statistical Models
- Optimization

Honors and Awards

- Awarded the College of Engineering Dean's Office scholarship at **Pennsylvania State University**. 2022
- **Ranked 29th**: in the Iran Nation-wide University Entrance Exam Known as Konkoor for M.Sc degree, among +40,000 test-takers. 2018
- **Ranked 40th**: in the Iran Nation-wide University Entrance Exam Known as Konkoor for B.Sc degree, among +250,000 test-takers. 2013
- **Silver Medalist**: of 30th Iran National Mathematical Olympiad. 2012
- Admission to middle school and high school in **National Organization for Development of Exceptional Talents (NODET) (success rate < 0.3%).** 2009

Thesis

M.Sc. Thesis: **Using Deep Neural Networks for Decoding Linear Codes**

Supervisors: Prof. Amini & Prof. Salehkaleybar

- Description: Decoding is treated as a classification problem in this approach, which is doomed by the curse of high dimensionality of training data. Afterwards, I used the belief propagation algorithm to design neural networks based on factor graphs of codes which helps to solve the high dimensionality problem of data and optimize decoding algorithms. The proposed algorithms both improve the performance in terms of bit error rate and reduce the computational complexity of decoding with respect to previous works.

B.Sc. Thesis: **Diagnosis of Eye Diseases by Using Recorded Signals from The Neural Retina**

Supervisor: Prof. Hajipour

- Description: I explored the physiology of the Neural Retina and investigated how neurons would respond to different stimuli in experiments. I worked on recorded MicroElectroRetinoGram (MERG) signal from mice. Afterwards, I wrote a code that could denoise a recorded signal and distinguish a healthy retina from unhealthy.

Work Experience

Data Scientist, Snowa Company — **Tehran, Iran**
Customer Relationship Management (CRM) Department — *2022*

- Customers Clustering with unsupervised algorithms such as Kmeans in Python.
- Finding Families among all customers with graph algorithms in SQL.
- Designing Data Warehouse.

Publications

Samira Malek, Saber Salehkaleybar, Arash Amini, **"Multi Variable-layer Neural Networks for Decoding Linear Codes"**, Iran Workshop on Communication and Information Theory (IWCIT), IEEE, 2020.

Samira Malek, Saber Salehkaleybar, Arash Amini, **"A Deep Neural Network Architecture for Decoding Linear Codes Based on the Parity Check Matrix"** to be submitted (it's available here).

Teaching Experiences

- **Teaching Assistant for Discrete Mathematics** Pennsylvania State University. Fall 2023
- **Teaching Assistant for Discrete Mathematics** Pennsylvania State University. Spring 2023
- **Teaching Assistant for Signal & System** Sharif Univesity of Technology. Fall 2019
- **Teaching Assistant for Stochastic Random Process & System** Sharif Univesity of Technology. Spring 2019
- **Teaching Assistant & MATLAB Teaching for Engineering Mathematics** Sharif Univesity of Technology. Spring 2019
- **Design Mock Test** of the Iran Nation-wide University Entrance Exam Known as Konkoor for B.Sc degree in Kanoon Institution, which has the most participants in Iran (more than +20,000 students every year). 2017–2018
- **Teaching Mathematics** Farzanegan High school (NODET), Preparing students for Iran National Mathematical Olympiad. 2014–2015

Selected Courses

Pennsylvania State University:

- Distributed Optimization (A)
- Large Scale Machine Learning(A)
- Deep Learning for NLP (A-)
- Algorithm Design and Analysis(A)

Sharif University of Technology:

- AI and Biological Computation (A+)
- Signal & System (A)
- Speech Processing (A+)
- Information hiding (A+)
- Engineering Probability and Statistics (A)
- Numerical Computation (A+)
- Digital Signal Processing(II) (A)
- Digital Communication (A)

Selected Academic Projects

Implementation of Stochastic Gradient Descent Ascent & Stochastic Compositional gradient
in Python, as a project of Distributed Optimization.
under supervision of Prof. Mehrdad Mahdavi *Summer 2023*

Training GPT by Prompting for multi-hop question answering task on HotPotQA
in Python, as a project of Deep Learning for NLP course.
under supervision of Prof. Rui Zhang *Spring 2023*

Implementation of Viterbi algorithm & Reduced Complexity Viterbi Sequence Detector
in MATLAB, as a project of Advanced Communication System course.
under supervision of Prof. NasiriKenari *Spring 2020*

Implementation of a FeedForward and a Recurrent Neural Networks for Pitch Tracking in Noisy Speech
in Keras, Extraction pitch contours by SIFT, HPS, and AMDF algorithms in MATLAB as a project of Speech Processing.
under supervision of Prof. Ghaemmaghami *Spring 2019*

in MATLAB, as projects of Numerical Optimization Methods course.
in MATLAB, as a project of Advanced Communication System course.
under supervision of Prof. BabaieZadeh *Fall 2018*

Recovering an image by IMAT and OMP algorithms,
Reconstruction of 1-D and 2-D Signals by SDFT and RS Methods
in MathCad, as projects of Digital Signal Processing(II) course.
under supervision of Prof. Marvasti *Fall 2018*

Design a Neural Network for Classification Right-handed and Left-handed Typing, with EEG Signal
in MATLAB, as a project of AI & Biological Computation course.
under supervision of Prof. Hajipour *Spring 2016*

Implementation of a Semi-iudo Graphical Game
in C Language, as a project of Introduction to Programming course.
under supervision of Prof. TaherKhani *Fall 2013*

Computer Skills

Languages: Python , MATLAB, SQL, C/C++, LaTeX, HTML

Softwares: Anaconda, Microsoft Power BI, Microsoft SQL Server Management

Languages

TOEFL Test: 95 (R:27, L:23, S:23, W:22) October 2021

GRE General Test: Overall Score 317 - Writing: 3.5 November 2021

Native: • Persian • Azerbaijani

Reference

References available upon request.